THE DER UPDATE

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Distributed Energy Resources...the Power of Choice

Industry News

Two Fuel Cell Installations in NJ Hotels

Fuel Cell Energy and PPL Corporation announced on April 17 that two Direct FuelCell® units will be installed at Starwood Hotels & Restaurants in New Jersey. PPL, a Northeast power company, signed an agreement with Starwood to install, own, and operate the 250-kW fuel cells. The fuel cells will likely be used in combined heat and power applications to provide approximately 25 percent of the hotels' electricity needs and 25 percent of the heat for their hot water needs. The New Jersey Clean Energy Program is investing $1.7 million to support the projects, which are some of the first to be awarded under the program. The projects are scheduled to begin this summer, and installation is expected to be complete by the end of the year.
Energy Info Source, April 17; Eyeforfuelcells.com, April 18

LIPA to Install 17 Fuel Cells

The Long Island Power Authority announced it will be installing 17 Plug Power Inc. fuel cells at several commercial and municipal customer locations on Long Island this summer. The 5kW units will operate in combined heat and power mode running on natural gas. These grid connected fuel cells will allow an initial assessment of fuel cells at a specific source. LIPA also has plans to install three 5kW units, operating on hydrogen, at several Long Island facilities. The funding for this new $3.6 million contract is being provided under LIPA's Clean Energy Initiative (CEI). The five-year, $170 million CEI was designed to facilitate the development and application of clean energy technologies.
Long Island Power Authority, April 24

Power Inverter for DP Market

UQM Technologies, Inc., a developer of alternative energy technologies, has completed the design and testing phase of a modular electronic inverter for distributed power applications. The prototype inverter is only one-third the size of comparably rated products available in the market today. Power electronic inverters are used to convert direct current output of power generation equipment such as reciprocating engines, gas turbines, solar panels, and wind turbines into alternating current. UQM Technologies' President and Chief Executive Officer William Rankin believes distributed power generation equipment has high growth potential and the development of this modular inverter is directed toward helping UQM become a market leader for power conversion products.
Eye For Fuel Cells, April 16

Northern Power to Construct CHP Unit for CA Plant

Northern Power Systems, Inc., a Vermont-based provider of alternative and renewable energy systems, will design, construct, and install a 1-MW combined heat and power (CHP) system for Pokka USA, a California soft drink bottler. The unit will consist of a natural gas-fired generator and heat recovery equipment and will be connected to the local utility grid. The system will cost about $1.9 million and will provide about 70 percent of Pokka's primary and standby power and 30 percent of its hot water needs. The waste heat the unit gives off during power production will be used to heat water that is used in the plant's bottle pasteurization process. Northern Power expects that the new CHP system will reduce Pokka's annual electricity bill by more than $800,000 and its boiler gas bill by 25 percent. It will also minimize plant down time and product spoilage due to utility power outages. The fuel efficiencies of the system qualify it for a $600,000 incentive rebate from the California Public Utility Commission's Self-Generation Incentive Program, which reduces the capital costs by 30 percent and the payback period to two years.
Energy Info Source, April 23

Largest U.S. Rooftop Solar Array Dedicated in CA

The Alameda County, California, Board of Supervisors dedicated the nation's largest rooftop solar installation as part of its Earth Day celebrations. The system is located atop the Santa Rita Jail in Dublin and was manufactured and installed by PowerLight Corporation. The first panels were constructed in 2001 with the capacity to generate 640 kW of electricity. After the jail experienced significant savings, it commissioned PowerLight to install additional arrays across more areas of the complex's roof, which increased the system's capacity to 1.18 MW. The solar array now covers approximately three acres of

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Next week's Integrated Energy Systems Peer Review will be in Nashville, TN on April 30-May 2 at the Opryland Hotel.

Reciprocating Engine Peer Review Meeting, April 23-24, Chicago, IL

The Department of Energy's Advanced Natural Gas Reciprocating Engine Peer Review was held April 23-24 at The Drake Hotel in Chicago, IL. This peer review was done in response to both a National Academy of Science recommendation for strategic peer review of programs under the Assistant Secretary for Energy Efficiency and Renewable Energy as well as a Department-wide strategic review to bring programs into alignment with the National Energy Policy.

A peer review of the overall DER program was held last year in November. Several of the programs within the DER office have already undergone the peer review process, including the Energy Storage, Distributed Power, Industrial Distributed Generation, Microturbine and Industrial Gas Turbine programs. A peer reviews is scheduled for the Integrated Energy Systems and Thermally Activated Technologies Program on April 30-May 2 in Nashville, TN. More information on past and future peer review events can be found at the DER website at www.eren.doe.gov/der. Presentations and meeting agendas for the peer reviews can also be found at this site.

The format of the one-and-a-half day event included a set of opening remarks and presentations that set the stage for the subsequent projects and gave context to the programs. Patricia Hoffman, DER Office Director, gave an overview of her office's activities as well as the priorities of the Energy Efficiency and Renewable Energy Office. Several other morning presentations on the reciprocating engine market and environmental policies provided additional context for the projects.

Three industry contractors including Caterpillar, Cummins, and Waukesha provided an update on their activities since receiving awards in mid-2001. They are receiving $15 million over five years. The recipients of four national laboratory awards totaling $3 million over three years also presented the results of their work from the past year along with the National Energy Technology Laboratory's work. An overview of seven University awards for $4.6 million over three years was also delivered. These projects are just getting underway and are focused on innovative/breakthrough technologies addressing ignition systems and friction reduction.

The goals of the Advanced Natural Gas Reciprocating Engine program are to produce a commercial engine by 2010 with:

- High Efficiency—Fuel to electricity conversion efficiency of at least 50%
- Environmental Superiority—NOx < 0.1 g/hp-hr (natural gas)
- Reduced Cost of Power—Energy costs including O&M, at least 10% less than current state-of-the-art engine
- Fuel Flexibility—Adaptable to future firing with dual fuel capabilities, include further adaptation to hydrogen
- Reliability and Maintainability—Equivalent to current state-of-the-art engines

the jail's roof.
PowerLight Corporation Press Release, April 22; photo: www.co.alameda.ca.us/srjp/index.htm

Racquet Club to be Powered by Solar Energy

Sun Power & Geothermal Energy, an energy solutions provider in San Rafael, California, will construct a solar power system on the roof of Mt. Tam Racquet Club, which is located in the San Francisco area. The 150-kW building-integrated system will cost $1.35 million and will provide approximately 50 percent of the club's electricity needs. It is expected to reduce the 51,000 square-foot facility's electricity bill from $60,000 per year to $5,000 per year or less, and payback on the investment is approximately 10 years. The solar energy system will be connected to the local utility grid.
Energy Info Source, April 18; Mt. Tam Racquet Club web site: www.mttamrc.com

Avista Fuel Cell Installed at DOD Facility

Avista Labs has installed a 3-kW fuel cell at the Washington Air National Guard facility in Spokane, Washington. It was put in place under the Department of Defense (DOD) Fuel Cell Demonstration Program that is managed by the U.S. Army Corps of Engineers Construction Engineering Research Laboratory. The unit is a SR-72 proton exchange membrane fuel cell with Avista's patented Modular Cartridge Technology™, which runs on industrial-grade bottled hydrogen. It is providing electrical power to a generator service bay. During the announcement of the installation, J. Michael Davis, CEO of Avista Labs, said, "it is programs like this that help move the technology from the laboratory into the real world." Under the agreement with DOD, Avista will operate and service the fuel cell.
Avista Labs Press Release, April 11; Eyeforfuelcells.com, April 18

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8 distinguished peer reviewers will be evaluating projects in the areas of oil heat combustion,, integrated energy systems, and thermally activated technologies.

DOE NEWS

International Energy Storage Meeting

Leaders of the Energy Storage field met in San Francisco on April 15 - 17 at EESAT 2002, an international conference on Electrical Energy Storage Applications and Technologies. Some 160 participants from 8 countries heard reports on the latest developments of storage technologies for a wide range of applications. Roughly one third of the presentations reported work funded by DOE, one third were from private industry, and one third were from abroad. The meeting, with most of the active manufacturers and researchers from around the world in attendance, documented the current status, the rapid growth, and the increasing importance of storage technology. Energy storage is emerging as an essential component of reliability in modern digital industry as well as in off grid village power systems in the developing world.

Fast support for voltage fluctuations on transmission lines, reliability for digital facilities, compensation for load variations in distributed generation, providing dispatchability for renewables, and peak load shifting were among the topics covered. Reports on many significant new installations were presented. The world's biggest storage facility with a capacity of 40MW is being built in Fairbanks, Alaska, to support a long transmission line. The first two applications of sodium sulfur batteries in the U.S are being initiated. MW size Vanadium Redox batteries have been installed in South Africa and Japan. Ultracapacitors are being explored for short term energy storage. Two entire sessions were devoted to flywheel applications and development. New developments in power electronics and conversion systems in the MW range were also presented.

The conference was organized by DOE and Sandia in cooperation with the Electricity Storage Association. Deputy Assistant Secretary Dr. Robert Dixon delivered the keynote address highlighting the importance of distributed energy resources and energy storage in fulfilling the agenda of the national energy plan.

NELHA Meeting

The Natural Energy Laboratory of Hawaii Authority (NELHA), which is located on the big island of Hawaii, is in the process of starting up the Gateway Project. The Gateway Project will include a flagship building that will be established as an incubator to facilitate the transfer of advanced DER technologies into use throughout the Islands. The cost of both retail electric power and gasoline in Hawaii is the highest of any of the 50 states, and there is a strong interest in, and commitment to, moving away from an overwhelming reliance on imported fossil fuels. To do so, the State Energy Office, the University of Hawaii (through their Hawaii Natural Energy Institute), and NELHA are undertaking the Gateway Project to evaluate various advanced and hybrid DER technologies. With no indigenous fossil fuel resources in the State, the long-term objective for Hawaii is to play a leadership role among the states in moving towards a hydrogen economy. The Gateway Project will be pivotal in this statewide effort, and a DER Advisory Committee (DERAC) has been formed to help focus these efforts. DERAC's membership consists of ten individuals, with three from outside Hawaii. Those three are Terry Surles (California Energy Commission), Chris Cameron (Sandia Labs, Albuquerque), and Gary Burch (DER/OPT/DOE). The DERAC held its first meeting on April 17th at the NELHA site in Kona, Hawaii; with the objective of preparing an overall strategy for moving forward with the Gateway Project. Construction of the Gateway Building is planned to start this summer.

Gary Burch had other meetings with key players from the State Energy Office, Hawaii's Natural Energy Institute, and the two largest utilities (HECO and HELCO). All of these entities are committed to working together to help move Hawaii away from their current need to import 90% of the total energy needs for the State.

Materials Tech Brief

The Oak Ridge National Laboratory is conducting advanced materials testing work to better understand the oxidation performance of stainless steels used in recuperators in industrial gas turbines and microturbines. Oxidation testing has been completed on the first series of model Fe-Ni-Cr alloys similar to ones used in recuperators. In the range 16-20wt.%Cr and 10-30wt.%Ni, there is a beneficial effect on oxidation resistance of adding either Cr or Ni. Testing is being conducted at 650°-800°C (1202°-1472°F) in air and air with 10vol.% water vapor. The addition of water vapor can cause accelerated corrosion attack where an iron-rich oxide is formed instead of the protective Cr-rich oxide formed in dry air. These results suggest that the oxidation behavior of type 347 stainless steel would benefit from increasing the Cr and/or Ni contents.

Calendar of Events

APRIL 2002			
30-May2	Houston Energy Expo	Houston, TX	www.nesanet.org
30-May2	Thermally Activated Technologies Peer Review	Nashville, TN	Jan Brinch 410-290-0370

The Opryland Hotel has a CHP installation on site that the attendees of the conference will tour.

Calendar of Events

MAY 2002			
1-3	External Combustion Engines—New Strategies for Efficient, Green Power Generation	Los Angeles, CA	chuck@intertechusa.com
2	Green Power: Turn it On! Getting to 10% Conference	Harrisburg, PA	Maryanne Daniel; 215-656-6964
6-7	Securing the Energy Infrastructure: Essential Strategies	Washington, DC	www.kemaseminars.com
6-8	Interconnecting Distributed Generation to Utility Distribution Systems	Madison, WI	http://epdweb.engr.wisc.edu/brochures/a873.html
6-10	2002 On-Site Power Generation School	Dallas, TX	www.egsa.org/meetings/schools.htm
12-14	American Gas Association Operations Conference	Chicago, IL	www.aga.org
12-15	The 8th National Clean Cities Conference and Expo	Oklahoma City, OK	www.ccities.doe.gov/conference.shtml
14-15	Distributed Generation Technology Seminar	Andover, MA	www.basler.com
14-16	E-Vision 2002: Shaping Our Future by Reducing Energy Intensity in the U.S.	Arlington, VA	Jeff Dowd; jeff.dowd@ee.doe.gov
14-17	Distributed Energy Conference	San Diego, CA	www.powerin.org
20	Congressional Fuel Cell Expo	Washington, DC	www.usfcc.com
20-21	Transmission Reliability Peer Review	Crystal City, VA	klong@sentech.org
20-21	Renewable Energy	Houston, TX	www.cbinet.com
23-24	FEMP DER Workshop	Atlanta, GA	www.eren.doe.gov/femp/techassist/der_resources.html
JUNE 2002			
2-5	Energy 2002 Workshop and Expo: Hot Challenges, Cool Solutions	Palm Springs, CA	(703) 243-8343, www.energy2002.ee.doe.gov
6-7	West Coast Energy Management Congress	Anaheim, CA	(703) 243-8343, www.aeecenter.org
16-18	National Accounts Conference and Exhibition (American Gas Association)	Nashville, TN	TheGasChoice.com
25-26	DER FEMP Workshop	Chicago, IL	www.eren.doe.gov/femp/techassist/der_resources.html
26-29	Building Energy 2002 and the Mid-Atlantic Sustainability Conference	East Brunswick, NJ	www.nesea.org
27-28	The Business Case for Cogeneration Regulatory Initiatives	Chicago, IL	www.cbinet.com
AUGUST 2002			
18-23	Summer Study on Energy Efficiency in Buildings	Pacific Grove, CA	www.aceee.org

More information on the peer review will be available in the next issue of the DER Update.